

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 21-25 and 32-36 are pending in the application, with claims 21 and 36 being the independent claims. Claims 21 and 34-36 are sought to be amended. Applicant reserves the right to prosecute similar or broader claims, with respect to the amended claim, in the future. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding rejections and that they be withdrawn.

***Obvious-Type Double Patenting Rejection***

In the December 10, 2009 Office Action, claims 21-25 and 32-36 were rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1, 3 and 9 of U.S. Patent No. 7,006,806 ("the '806 patent"). (*See* Office Action, pages 5-7.)

Applicant respectfully requests that the currently asserted double patenting rejection be held in abeyance until claimed subject matter is otherwise deemed allowable. After analyzing the final allowed claim scope, Applicant will consider filing a terminal disclaimer if necessary to overcome an obviousness-type double patenting rejection.

***Rejection under 35 U.S.C. § 103***

Claims 21-25 and 32-36 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,404,405 to Collier *et al.* ("Collier") in view of U.S. Patent No. 4,716,589 to Matsui ("Matsui") in further view of U.S. Patent No. 6,002,726 to

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Simanapalli *et al.* ("Simanapalli"). Applicants respectfully traverse this rejection and the Response to Arguments on pages 7-9 of the Office Action.

***Claim 21***

Without acquiescing to the propriety of the rejection, independent claim 21 has been clarified to recite features that distinguish over the applied references. For example, claim 21 recites, among other features, "a denominator device that estimates a value  $1/X(n)$  based at least in part on a prior estimated value of  $1/X(n)$  and a variable transition speed of  $X(n)$  ... ***wherein a control signal is used to change the variable transition speed of  $X(n)$ .***" (Emphasis added).

The Examiner notes that neither Collier or Matsui teach or suggest at least this distinguishing feature. Rather, the Examiner relies only on Simanapalli to allegedly teach at least the above-noted distinguishing feature. Applicant respectfully disagrees.

Simanapalli does not disclose the claimed "a denominator device that estimates a value  $1/X(n)$  based at least in part on ... a ***variable*** transition speed of  $X(n)$  ..., wherein a ***control signal is used to change the variable transition speed of  $X(n)$ .***" In particular, Simanapalli does not disclose that the sampling rate (*transition speed of  $X(n)$*  as alleged by the Examiner) can be changed using a ***control signal***.

Without conceding that Simanapalli discloses "transition speed of  $X(n)$ [,]" Applicant submits that Simanapalli is inoperable to change the transition speed of  $X(n)$  using a control signal or otherwise. According to the M.P.E.P., "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention, then the teachings of the references are not sufficient to render the claims prima facie obvious." M.P.E.P. § 2143.01(VI) (citing *In re Ratti*, 270 F.2d 810 (CCPA 1959)) For example, Simanapalli teaches the equations given in operational block 78 of Figure 3 ***only***

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***hold true when*** “the envelope changes between adjacent samples are very small if the sampling rate is sufficiently high[.]” (See Simanapalli, column 5, lines 34-52.) Thus, Simanapalli teaches that the sampling rate be sufficiently high and remain sufficiently high (*i.e.*, essentially constant) such that the envelope changes between samples are very small. Since Simanapalli teaches of trying to maintain very small envelope changes between adjacent samples, Simanapalli teaches of wanting substantially no speed changes of  $X(n)$ . In addition, the use of the phrase “sampling rate” in Simanapalli inherently discloses a constant sampling time interval, with no variability.

Consequently, Simanapalli not only fails to teach or suggest the ability to change the sampling rate using a control signal, Simanapalli would be inoperable if modified to include the recited change of the sampling rate. This teaching in Simanapalli is fundamentally different from at least the above-noted distinguishing feature of amended claim 21.

Furthermore, Simanapalli uses Chebyshev approximation that “***requires a limited and predefined interval in which expansion is to be carried out.***” (See Simanapalli, column 4, lines 28-33.) Thus, Simanapalli teaches that  $I^2(n)$  and  $Q^2(n)$  components of a signal must be scaled based on a predefined interval in order for the approximation to work. (See Simanapalli, column 4, lines 48-55.) The  $I^2(n)$  and  $Q^2(n)$  components must then be scaled back after the approximation is evaluated. The transformation of  $I^2(n)$  and  $Q^2(n)$  to be within a limited and predefined interval is a fundamental part of all embodiments of Simanapalli, since it relates to using Chebyshev approximation to evaluate  $1/X(n)$  by polynomial expansion. This is a non-trivial difference between Applicant's claims and the teaching of Simanapalli.

For at least the foregoing reasons, as Simanapalli does not cure the deficiencies noted by the Examiner in Collier and Matsui, independent claim 21 is patentable over the

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combination of Collier, Matsui, and Simanapalli. Dependent claims 22-25 and 32-35 are similarly patentable over the combination of Collier, Matsui, and Simanapalli for at least the same reason as claim 21, from which they depend, and further in view of their own respective features. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 21-25 and 32-35.

As noted, the dependent claims are also patentable over the applied references for their additional distinguishing features. For example, claim 34 recites, in part, “the error value is scaled by a value of a scaling coefficient before being added to the prior estimated value of  $1/X(n)$  ... *wherein the value of the scaling coefficient is different from the error value.*” (Emphasis added).

On pages 4-5 and 9 of the Office Action, the Examiner relies on Simanapalli as allegedly teaching at least the above-noted distinguishing features. Applicant respectfully disagrees.

According to the Examiner, the error value and the scaling coefficient are allegedly seen in the second term of the expression given in operational block 78 of Figure 3 of Simanapalli. (See Office Action, page 9.) However, a single term of the expression *cannot* at once be an error value and a separate scaling coefficient with a value that is different from the error value. Therefore, Applicant submits that Simanapalli does not disclose the recited scaling coefficient based on the variable transition speed of  $X(n)$ , “*wherein the value of the scaling coefficient is different from the error value.*” Thus, for this additional reason, claim 34 should be found patentable over the applied references.

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***Claim 36***

Without acquiescing to the propriety of the rejection, independent claim 36 has been clarified to recite features that distinguish over the applied references. For example, claim 36 recites, among other features, “the FM demodulator including a denominator device that estimates a value  $1/X(n)$  based at least in part on a prior estimated value of  $1/X(n)$  and an error value substantially equal to  $[1-X(n)/X(n-1)]$ ; ..., wherein the error value is scaled by a value of a scaling coefficient based on a variable transition speed of  $X(n)$  before being added to the prior estimated value of  $1/X(n)$ [,] ***wherein the value of the scaling coefficient is different from the error value, and wherein a control signal is used to change the value of the scaling coefficient based on the variable transition speed of  $X(n)$*** [,]” as recited in claim 36 (Emphasis added).

The Examiner notes that neither Collier or Matsui teach or suggest at least this distinguishing features. Rather, the Examiner relies only on Simanapalli to allegedly teach at least the above-noted distinguishing features. Applicant respectfully disagrees.

Simanapalli does not disclose the recited using a control signal to change the value of the scaling coefficient based on the variable transition speed of  $X(n)$ . Rather, as discussed for claim 21 in which a control signal is used to change the variable transition speed of  $X(n)$ , Simanapalli teaches of wanting substantially no speed changes of  $X(n)$  because Simanapalli teaches of trying to maintain very small envelope changes between adjacent samples. Since the recited control signal is used to change the value of the scaling coefficient based on the changing transition speed of  $X(n)$ , Applicant submits that Simanapalli would be inoperable for its intended purpose if modified to include the recited control signal to change the value of the scaling coefficient based on the variable transition speed of  $X(n)$ .

Simanapalli also does not disclose the recited a scaling coefficient based on the variable transition speed of  $X(n)$ , “wherein the value of the scaling coefficient is different from the error value,” as recited in claim 36, and similar to the distinguishing feature in claim 34. As noted above, the approximation technique in Simanapalli requires the  $I^2(n)$  and  $Q^2(n)$  components of a signal to be within “a limited and predefined interval” for approximating a value  $1/X(n)$ . This is another fundamental difference between Simanapalli and the claims.

Thus, as Simanapalli cannot be used to remedy the deficiencies of Collier and Matsui with respect to at least the above-noted distinguishing features of claim 36, the applied references cannot be used to establish a prima facie case of obviousness.

For at least the foregoing reasons, as Simanapalli does not cure the deficiencies noted by the Examiner in Collier and Matsui, independent claim 36 is patentable over the combination of Collier, Matsui, and Simanapalli. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 36.

### ***Conclusion***

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

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Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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